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ABSTRACT

School districts must analyze demographic data carefully if they hope to deal effectively with changing enrollment patterns. Sources of relevant data include local planning boards, utility companies, government records of vital statistics, carefully conducted school censuses, and municipal records of housing construction and property transfers. The cohort survival method is the most common method for analyzing enrollment data. The type of analysis selected to establish survival ratios, whether based on straight averages or weighted (trend) averages, should be appropriate to the particular conditions of the school district. (Author/PGD)

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DEMOGRAPHIC FACTORS RELATED TO ENROLLMENT PROJECTIONS

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It seems, at times, that education changes very little particularly at the local school district level. The records of the Herricks school district on Long Island support this conclusion. The district was created in 1823 and has been in continuous operation to this date. The official minutes of the Herricks Board of Education more than one hundred years ago reveal that agenda items included such matters as: (1) Awarding a contract for carting children to school by wagon (transportation); (2) Consolidating children in one school with a total enrollment of 37 and closing three existing schools (closing neighborhood schools); (3) Approval of bids for 2 cords of wood (heating); (4) Recommendations to terminate the teacher based on an inspection conducted by one trustee and the local minister (supervision and evaluation); (5) Authorization of an addition to the school house in order to create a second classroom (school building construction); (6) Approval of payments to one I.U. Willets of $1.00 for mowing the school yard (ground maintenance), and (7) Acceptance of a report on the number of the resident minor children in the district (annual school census).

Even at that time the latter was a responsibility of school trustees. The report simply listed children from 0 to 18 years of age and the head of household. Occasionally notations appear indicating that a child had been apprenticed to a cabinet maker (vocational education) or that a child was simple and was kept at home (special education). In 1850 the annual school census was used in part for planning purposes just as it is by the Herricks school district in 1980. However, in the thirty-five years following WW II, the Herricks school district was transformed from a truck farming area to a highly developed upper middle class suburb of New York City. Public school enrollments grew rapidly during the twenty years, 1945 to 1965, when they

peaked at 6,500. Another 1,500 resident students attended non-public schools. From 1965 to 1975, enrollments declined to 3,200 - a phenomenon common to metropolitan areas and tc regions such as the Northeast and the North Central states.

Enrollment Forecasting

If the Herricks annual school census had been in error by 5% in 1850, the difference in enrollments would have amounted to two children. When enrollments reached 6,500, an error of 5% would have amounted to 325 children or the equivalent of a fair-sized elementary school.

During the 1950's and early 1960's, a growth period in school aged children, projections were necessary to support proposals for additional schools. The enrollments projected for ten years in advance were questioned by voters who were being asked to approve millions of dollars of construction bonds. There were expressions of disbelief regarding the growth projected and often emotional statements that the new facilities being requested by boards of education and administrators would become mausoleums which would never be filled. But the credibility gap between reluctant voters and planners was more superficial than real.

Usually referenda for new school construction lagged behind actual needs during the growth period. Before a referendum was proposed, school districts were likely to be on double sessions and shortened school days. In some instances school boards demanded that developers donate a school site as a condition of supporting new housing development. Promotional sales of housing developments often resulted in a sell out over one week-end. Parents who had themselves recently moved into the community and then were told that their children would be assigned to half day sessions because of overcrowding, needed little convincing that the enrollment projections of growth were reliable. Under these conditions, the methodology and the assumptions upon which enrollment projections were based were rarely

questioned. The preciseness of projections was not vigorously questioned since most felt that additional schools were needed and, in any event, would ultimately be filled as the school district continued to grow.

In a declining enrollment situation, the mind set of a community and parents is quite different. Skepticism is high. There is shock followed by disbelief when it is suggested that one or more schools may not be needed and might be closed. Parents whose children are assigned to schools likely to close know that their children will be reassigned to other schools perhaps more distant. Other parents sense that a general redistribution of all children may occur in order to balance enrollments in the remaining schools. The issue is compounded by concerns such as:

1. The ultimate disposition or use of schools which are closed.
2. The effect on class sizes when children are reassigned to the remaining schools.
3. The impact on property values in the neighborhood of a school which is closed.
4. The fear that an unoccupied school building may create an attractive nuisance encouraging vandalism and other undesirable activities.

It is understandable that the data base which the public demands in a declining situation must be more complete and more reliable than is demanded in growth situations. Boards of education and school administrators should accept this reality by utilizing demographic data to explain and corrobarate the long range enrollment projections upon which decisions will be made. Demographic data regarding population, housing, and live births help to improve the accuracy and credibility of projections.

Population Trends

The United States Census Bureau reports that the national population grew by more than 32 million in the period 1960 to 1975. It is expected to grow another 8 million by 1980.

Without some analysis these data can be misleading. While the total population grew during the period 1960 to 1975, the rate of growth has slowed from 7.1% during 1960 to 1965, to 4.1% during 1970 to 1975. But despite the overall growth, a decline of approximately 4 1/2 million occurred in the group under age 5 during this period. The age group 55 and over, on the other hand, has increased - an indication that the national population is aging.

National trends are useful as general indicators of trends. But since changes in population characteristics occur unevenly in the various parts of the country, they must be examined by region, by state, by county, and by school district if at all possible. The Northeast for example, is growing at a rate of less than 1% every five years. The North Central region has a growth rate of 2%. The South and the West are growing at the rate of 10%. Florida, Alaska, and Arizona have a growth rate of 25% while New York State and Rhode Island have experienced a decline in total population. It is imperative that data for the civil division in which the school district is located be obtained. Even in a state like New York which reports a population decline, there are school districts which are experiencing growth while others are declining. However, the inner suburbs in a metropolitan area such as New York are declining in population just as the State is.

Demographic Data

There are numerous sources of data available which often are overlooked. These sources are extremely useful in developing a more sensitive and defensible basis for long range planning.

Most counties and even towns have planning boards. They conduct studies which include projections of probable development based upon zoning regulations, the availability of water, sewage disposal, health standards, and other considerations which affect future development. A master plan which delineates where and how development, if any, will occur, exists in many instances.

Local planning boards can be the source of rather detailed information useful to school planners. Many can provide data on population density - that is the number of persons per acre for the area and even the school district. In addition, such boards may project the population at saturation. The estimate of saturation takes into consideration vacant lots, undeveloped parcels, large estates which may be sold to developers, wetlands and green belts controlled by the federal or local government, farmland and golf courses which are committed to tax abatement programs prohibiting a change in present use. A comparison of present population density and potential density at saturation can give added support for decisions of planners.

Most utility companies (gas, electric, water) conduct independent studies of the needs of the clients in their service area. Since public utility companies are regulated and must justify the level of service rendered, they develop sophisticated methodologies for reports they are required to submit annually to public agencies. These reports include meter counts and the number of persons per meter location. They indicate the type of housing where meters are located in categories such as single family, apartments, condominiums, senior citizen, etc., and the size and composition of households at these locations. Based on this methodology, population estimates are made and updated each year. The Long Island Lighting Company issues such a report annually. The estimates are reported for each of the 330 communities in its service area.

Another important source of information is government records of vital statistics. The number of births and deaths are recorded in all locales though variations on how they are aggregated and reported may exist. Statistics on live births are particularly important in predicting kindergarten enrollments (births five years previous to predict present kindergarten). Failure to utilize live births in enrollment

projection increases the probability of error.

School Census

The school census in many districts is conducted rather casually. Some view the school census as a state mandate which must be met but need not be terribly accurate in the absence of a special need. A mail census taken without any great follow-up effort often results in a low response rate. Where a door-to-door census is taken there may be little supervision of the census takers. Some districts have been known to use students, bus drivers, CETA workers, or unpaid volunteers. Incomplete and inconsistent census data are of little or no value when a need for historical data arises.

Even when high response is obtained, the census data traditionally collected may not be appropriate for the needs in a declining enrollment district. Some major deficiencies of the tradition census, however well done, are:

1. A relatively accurate count of public school children is obtained, but the count of non-public school resident children is often sketchy. The patterns of transfer from public to non-public schools and the reverse is not clear. Residents are rarely questioned about their intentions to choose a public or non-public school (this is most important for pre-school children).

2. The number and percentage of families with children 18 years of age and under is often not aggregated. It follows that the number and percentage of families without children 18 years of age and under is not known. Such information for a ten-year period could indicate important trends affecting enrollments.

3. Most school census reports are not likely to access the average number of pre-school and school age children per household. This is valuable data historically as one looks for trends and as one tries to estimate the impact of changing family formations on future enrollments. Data which indicate the number of children yielded by certain types of housing - single family homes, apartments, etc., should enhance the accuracy of enrollment projections.

4. More often than not the school census if not keyed to a geographic file. As a result, the data deal solely with the increase or decrease of children of various ages. They do not, typically, identify with precision the geographic areas in which increases or decreases are occurring. Nor do they provide a means for making long range projections by geographic area. Information of this sort is critical when a school closing and/or redistricting is contemplated.

Housing Data

Just as with automobiles, exact records on housing construction and property transfers are maintained in most municipalities. The collection of a fee for such transactions may, in part, account for the fact that records are so meticulously kept. Although they are not maintained for school planning purposes, they are public records and are an important source of information for school planners.

Generally builders of new homes are required to submit a plan which must be approved by some public authority. The approval will record the number of housing units contemplated and the time line for completion. Thus the number of building permits issued each year is an important barometer of the new construction activity in the school district. However, before a housing unit can be occupied, a certificate of occupancy will usually be required by a bank or the mortgagor financing the purchase. The number of certificates of occupancy issued is even more closely related to the number of new families moving into the district.

A ten year history of the number of building permits issued and the number of housing units which are actually ready for occupancy is instructive. Trends or unusual fluxations can be noted and then related to school enrollments which can be expected to reflect what is occurring in housing construction within the school district.

Another factor is the number of resales that occur annually and the characteristics of families in the exchange of homes. Deed transfers of resales are recorded, usually chronologically, in the records of communities throughout the country. Such records have the limited objective of identifying the previous owner and the new owner of record. This provides an initial list of names and a count of resales. In metropolitan and particularly suburban areas, service agencies provide detailed information on resales to realtors, on a weekly basis. All resales are recorded as to sale price, purchaser, address, previous house ownership, amount of mortgage, mortgage holder, etc. In some instances, organizations such as Multiple Listing Service will provide detailed computer print outs by school district or postal zip code. These kind of data and in-depth interviews with realtors should provide an excellent information bank on housing. Realtors are especially knowledgeable about the family characteristics of sellers and buyers. It is almost a necessity that information about the ages of parents and children, financial status, public or non-public school preferences, etc., be ascertained as realtors close a sale. Most realtors are willing to share this information which is invaluable in drawing conclusions about the net effect of in and out migration.

Demographics and Forecasting

The forecasting by school planners procedure most commonly used is the cohort survival method. By following a cohort through successive grades, a migration or survival ratio is computed. The usefulness of demographic data is two fold. First the data influences the selection of the ratios which are most appropriate for the particular school district. The ratio selected may be a straight 5 year average ratio, it

may be based on the most recent 3 year average, it may be a trend ratio. The tables on pages 10 and 11 illustrate the differences in ratios when computed as a straight average and as a trend or weighted average.

The second use which can be made of demographic data is as help in understanding the migration ratios and any out of the ordinary fluctuations.

The ratios in Table 1, for example, are rather consistantly below 1.000, indicating a net out migration. In this instance, an aircraft manufacturer in the area had obtained a major overseas contract. Large numbers of employees, many of whom resided in the district, were assigned to this project over a period of years. The resale market was very slow. In fact, a sizeable number of vacant homes were on the market. New construction was almost at a standstill.

The ratios for grades 6 to 7 and grades 8 to 9 are exceptions (more than 1.000). They are in the main explained by the pattern of transfers from non-public to public schools peculiar to the district. Table 2 on the other hand, presents quite different migration ratios. In the main ratios exceed 1.000, an indication of a net in-migration. This district is viewed as a highly desirable residential area. Housing prices have escalated rapidly. Some new construction is occurring. More importantly, realtors reported an extremely active resale market. Buyers tend to be young couples beginning to form families, while sellers are apt to be "empty nesters," who are capitalizing on the extraordinary capital gains.

Enrollment projections are, afterall, estimates which are subject to error. They are challenged especially in declining enrollment situations. In a period of declining enrollments, it is essential that the projections upon which decisions, often unpopular, are made are supported by the best data available. A rigorous methodology should insure greater accuracy and credibility.

TABLE 1

Migration (Survival) Ratios

Grade-By-Grade & Five-Year Averages

	1973-74	1974-75	1975-76	1976-77	1977-78	MR 5 Yr. Av.	MR 5 YR Trend[1]
B-K	.076	.073	.069	.056	.057	.066	.056
K-1	.936	.950	.936	.948	.992	.952	.952
1-2	.989	.988	.939	.983	.957	.971	.971
2-3	1.020	.989	1.003	.953	1.003	.994	.987
3-4	.989	1.003	.981	.964	.969	.981	.971
4-5	.988	1.002	.986	.994	.984	.993	.991
5-6	.984	.963	.976	.977	.983	.977	.975
6-7	1.036	1.045	1.018	1.005	1.064	1.034	1.034
7-8	1.007	.956	.995	.987	.940	.977	.970
8-9	1.070	1.058	1.041	1.039	1.036	1.049	1.039
9-10	.964	.980	.952	.970	.960	.965	.965
10-11	1.000	1.009	.982	.952	.940	.977	.958
11-12	.968	.979	.989	.971	1.015	.984	.989

TABLE 2

MIGRATION (SURVIVAL) RATIOS

GRADE-BY-GRADE AND FIVE-YEAR AVERAGE

	1974-75	1975-76	1976-77	1977-78	1978-79	MR 5 YR. AV.	MR 5 YR TREND
B-K	0.062	0.063	0.058	0.059	0.052	0.059	0.055
K-1	1.023	1.043	1.092	0.989	1.092	1.048	1.062
1-2	0.998	0.989	0.972	0.962	0.982	0.980	0.974
2-3	1.026	0.967	1.014	0.971	0.997	0.995	0.991
3-4	1.040	1.046	1.019	1.000	1.022	1.025	1.014
4-5	1.009	0.958	0.993	1.014	1.019	0.999	1.013
5-6	1.011	1.002	0.987	0.990	1.009	1.000	1.000
6-7	1.011	1.015	1.002	1.047	0.995	1.014	1.009
7-8	1.019	1.016	0.980	1.032	1.019	1.013	1.017
8-9	1.020	1.037	1.026	1.024	1.002	1.022	1.014
9-10	1.107	1.130	1.072	1.074	1.092	1.095	1.086
10-11	0.890	0.875	0.883	0.909	0.931	0.898	0.916
11-12	0.983	1.008	0.978	0.998	1.003	0.994	0.997